ANALYSIS OF TRADING MECHANISMS FOR CARBON EMISSION CREDITS GENERATED BY LOCAL PROJECTS UNDER KYOTO PROTOCOL

By

W.K.B.P.M. Fernando

The Dissertation was submitted to the Department of Computer Science & Engineering of the University of Moratuwa in partial fulfillment of the requirement for the Degree of Master of Business Administration.

Department of Computer Science & Engineering
University of Moratuwa
December 2005

Declaration

I certify that this dissertation does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any university to the best of my knowledge and believe it does not contain any material previously published , written or orally communicated by another person or myself except where due reference is made in the text. I also hereby give consent to use my dissertation, if accepted, to be made available for photocopying and for interlibrary loans and for the title and summary to be made available to outside organizations.

.....

Candidate

To the best of my knowledge, the above particulars are correct.

.....

Supervisor

Acknowledgements

This research study was carried out as part of the MBA in IT program conducted by the University of Moratuwa. I would like to thank Dr. Sarath Dassanayake who supervised this research, for giving valuable guidance and advise in carrying out the research activities effectively. I also like to thank all the staff members of Computer Science and Engineering Department and the Management of Technology Department of University of Moratuwa for their assistance.

Mr. Anura Jayathilake, Head of the Environmental Economics and Global Affairs Division of the Ministry of Environment of Sri Lanka deserves special thanks for providing valuable information about local projects under Clean Development Mechanism (CDM) and the contact details of the companies and information relating to the regulatory framework and the certification process under the Kyoto protocol. I would also like to thank all the private companies who responded to the questionnaire by providing data on CDM project activities and the financial information relating to these projects.

Finally I would like to thank all my friends and family members, specially my wife for assisting in many ways to complete the research on time.

Contents

List of Tables

List of Figures

Appendices

Acronyms

AAU	Assigned Amount Unit
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
COP	Conference of the Parties
EB	Executive Board
ERU	Emission Reduction Unit
EU ETS	European Union Emission Trading Scheme
GHG	Green House Gasses
IET	International Emissions Trading
INCaF	ICF Netherlands Carbon Facility
JI	Joint Implementation
MOE	Ministry of Environment
OECD	Organization for Economic Co-operation and Development
UNFCCC	United Nations Framework Convention on Climate Change
USD	US Dollars

Abstract

This research study was carried out as part of the MBA in IT program conducted by the University of Moratuwa. This is an exploratory type of research carried out to analyze the trading mechanisms for carbon emission credits generated under the Kyoto protocol. This study explores the existing trading mechanisms for Certified Emission Reductions (CERs), a tradable commodity generated under Clean Development Mechanisms (CDM) of the Kyoto Protocol and proposes an electronic trading system to improve the trading efficiency and the liquidity of the commodity.

Currently, a number of CDM projects are under way in Sri Lanka and most of these projects are power generation plants based on renewable energy sources. Even though most of these projects are financially viable, they would not have been implemented in the absence of additional financial benefits generated by selling CERs due to various reasons including long pay back period, high initial cash outflows and other uncertainties attributed to this industrial sector. These private companies are finding it difficult to attract funding for CERs at a reasonable price compared to market value of substitute products. The existing negotiation process is lengthy and complex and there are many other deviations from perfect market conditions applicable to these trading mechanisms. Due to these reasons, the liquidity of CERs is very low and there is very high price volatility.

The average price obtained by local CDM projects for CERs is considerably less than the current market price of substitute carbon products. There are several well established carbon emission markets in USA and Europe that facilitates trading of these various different carbon emission products but such a system is not available for trading of CERs. Due to the low liquidity of CERs and many other reasons, only a very small fraction of the potential CDM capacity in Sri Lanka is considered for actual implementation up to now. To avoid above problems and to obtain maximum possible financial benefits from Kyoto Protocol, an electronic trading system is proposed to facilitate trading of CERs.

The proposed trading system incorporates a trading model that enables anonymous trading that facilitates trading without disclosing ones identity to the market. Buy and sell orders will be displayed by aggregating the total volume available at each price. The trading model will also support executing already negotiated trades on the trading system enabling outside parties to make use of the straight through processing features available

for electronic trading systems. All or none execution facilities will be provided if a trader does not want his order to get partially executed. All market data will be based on moving average for a specific period. A flexible transaction commission structure will be used to allow large institutional investors to carry out trading without paying excessive commission.

The proposed electronic trading system will establish perfect market conditions by bringing together prospective buyers and sellers of CERs into a single place and making the price information freely available to everyone. An electronic trading system will enforce equal status for all the participants, avoiding the problem of unequal bargaining powers of buyers and sellers. Latest straight through transaction processing will enable speedy settlement of transaction proceeds and transfer of CERs between the registries of different parties. An electronic trading system will provide an efficient platform for the trading of CERs generated by CDM projects and will be able to bring together a wide audience of buyers and sellers into one trading system. This will help to improve the liquidity of CERs and will facilitate the establishment of equilibrium price for CERs where the demand and supply matches each other, thus reducing the price volatility of the commodity. Establishment of such trading system will greatly benefit all the non Annex I parties, specially countries like Sri Lanka that is not a big player of the CER market in terms of generated volume.

The trading system should be operational at least by early 2007 because, most of the current CDM projects will be operational by that time and the demand from all Annex I countries will considerably increase as the commitment period from 2008 to 2012 will be getting closer by then. The geographical scope that should be targeted for the initial implementation of the trading system should cover at least South Asian region since this region will be generating enough CERs to attract a large pool of buyers. Initially, the trading system should facilitate spot trading of CERs and Futures contracts of CERs as a minimum.

The proposed electronic trading system will be financially feasible considering the projected CER volume for the region, CER price under perfect market conditions, proposed transaction commission structure, etc. There will be enough incentive for brokerages participate in this trading system and existing brokerages currently managing the trading of equities or some other commodities will make a move into the trading of CERs which is expected be a multi billion dollar business in few years.